Notice of Allowability	Application No.	Applicant(s)	
	10/798,820	SHIBANUMA ET AL.	
	Examiner	Art Unit	
	Marie R. Yamnitzky	1774	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Amendment filed 24 Oct 2006 & TD filed 02 Nov 2006*.

2. ☒ The allowed claim(s) is/are *11-13,16-19,22-25,28-31 and 34-42*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☒ Certified copies of the priority documents have been received in Application No. *09/704,968* .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *10262006, 11022006 and 11072006*.
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

The terminal disclaimer filed on November 02, 2006, disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent No. 6,524,728, has been reviewed and is accepted. The terminal disclaimer has been recorded. Accordingly, the obviousness-type double patenting rejection is overcome.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with John Keyes on November 07, 2006. (The specific changes to the specification were not discussed during the telephone interview. The examiner informed applicant's representative that spelling errors noted by the examiner would be corrected.)

The application has been amended as follows:

The title has been changed to:

BATHOPHENANTHROLINE COMPOUND AND EL DEVICE

In the specification:

The continuing data statement added to page 1 by preliminary amendment filed March 11, 2004 has been amended as follows:

This application is a continuation of prior Application 09/704,968, filed November 2, 2000, now U.S. Patent No. 6,972,334, incorporated herein by reference to the extent permitted by law.

Page 14, third line from the bottom of the page: "2-ethylheyxl" has been changed to --2-ethylhexyl--.

Page 15, first paragraph (replacement paragraph filed February 13, 2006), line 5: "4-isopropylbnezyl" has been changed to --4-isopropylbenzyl--.

Page 15, fourth line from the bottom of the page: "2-benzoxazoryl" has been changed to --2-benzoxazolyl--.

Page 15, third line from the bottom of the page: "benzothiazoryl" has been changed to --benzothiazolyl-- and "2-benzoimidazoryl" has been changed to --2-benzoimidazolyl--.

Page 16, line 15: "3-tert-butlphenyl" has been changed to --3-tert-butylphenyl--.

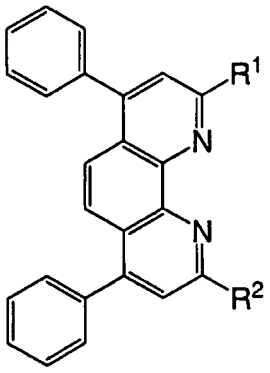
In the claims:

1-10. (Canceled)

11. (Currently amended) An electroluminescent device comprising a first electrode, a second electrode, an electron transport layer, a hole transport layer, and a hole-blocking layer, wherein,

(a) the hole-blocking layer is distinct from the electron transport layer, and

(b) the hole-blocking layer comprises a compound of formula (I):



formula (I)

wherein R^1 and R^2 are independently selected from the group consisting of an ethyl group, an n-propyl group, an isopropyl group, a n-butyl group, a sec-butyl group, a tert-butyl group, an n-pentyl group, an iso-pentyl group, a neopentyl group, a tert-pentyl group, a cyclopentyl group, a methylcyclopentyl group, a dimethylcyclopentyl group, a trimethylcyclopentyl group, a tetramethylcyclopentyl group, an n-hexyl group, a 2-ethylbutyl

group, a 3,3-dimethylbutyl group, a cyclohexyl group, a methylcyclohexyl group, a dimethylcyclohexyl group, a trimethylcyclohexyl group, an ethylcyclohexyl group, a diethylcyclohexyl group, a triethylcyclohexyl group, ~~a 2-ethylheyxl~~ a 2-ethylhexyl group, an n-nonyl group, an n-decyl group, an n-dodecyl group, an n-tetradecyl group, an n-hexadecyl group, a benzyl group, a phenethyl group, an α-methylbenzyl group, an α,α-dimethylbenzyl group, a 1-naphthylmethyl group, a 2-naphthylmethyl group, a furfuryl group, a 2-methylbenzyl group, a 3-methylbenzyl group, a 4-methylbenzyl group, a 4-ethylbenzyl group, a 4-isopropylbenzyl group, a 4-tert-butylbenzyl group, a 4-n-hexylbenzyl group, a 4-nonylbenzyl group, and a 3,4-dimethylbenzyl group.

12. (Previously presented) The electroluminescent device of claim 11, wherein at least one of the electrodes comprises a material which is one of transparent and translucent.

13. (Previously presented) The electroluminescent device of claim 12, wherein at least one of the electrodes comprises indium tin oxide (ITO).

14-15. (Canceled)

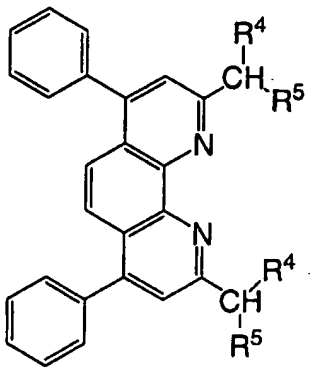
16. (Previously presented) The electroluminescent device of claim 11, wherein the hole transporting layer is luminescent.

17. (Currently amended) An electroluminescent device comprising a first electrode, a second electrode, an electron transport ~~layers~~ layer, a hole transport ~~layers~~ layer, and a hole-blocking layer,

wherein,

(a) the hole-blocking layer is distinct from the electron transport layer, and

(b) the hole-blocking layer comprises a compound of formula (II):



formula (II)

wherein:

R^4 is selected from the group consisting of hydrogen and methyl and R^5 ~~are independently~~ is selected from the group consisting of ~~hydrogen,~~ methyl, cyclohexyl, phenyl, methylphenyl, dimethylphenyl, trimethylphenyl, naphthyl, methylnaphthyl, dimethylnaphthyl, fluorenyl, methylfluorenyl and dimethylfluorenyl; or

~~with the proviso that~~ each of R^4 and R^5 ~~may not both be hydrogen~~ is phenyl.

18. (Previously presented) The electroluminescent device of claim 17, wherein at least one of the electrodes comprises a material which is one of transparent and translucent.

19. (Previously presented) The electroluminescent device of claim 18, wherein at least one of the electrodes comprises indium tin oxide (ITO).

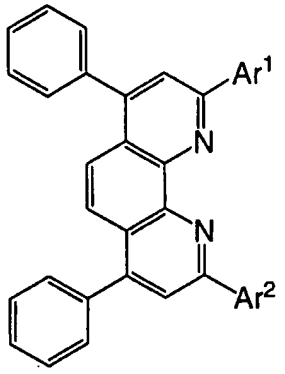
20-21. (Canceled)

22. (Currently amended) The electroluminescent device of claim 17, wherein ~~at least one~~ the hole transporting layer is luminescent.

23. (Currently amended) An electroluminescent device comprising a first electrode, a second electrode, an electron transport layer, a hole transport layer, and a hole-blocking layer, wherein,

(a) the hole-blocking layer is distinct from the electron transport layer, and

(b) the hole-blocking layer comprises a compound of formula (III):



formula (III)

wherein Ar^1 and Ar^2 may be the same or different and are independently selected from the group consisting of ~~a,~~ a 2-anthryl group, a 4-quinolyl group, a pyridyl group, a 3-pyridynyl group, a 2-pyridynyl group, a 3-furyl group, a 2-furyl group, a 3-thienyl group, a 2-oxazolyl group, a 2-thiazolyl group, a ~~2-benzoxazoryl group, a 2-benzothiazoryl group, a 2-benzoimidazoryl~~ 2-benzoxazolyl group, a 2-benzothiazolyl group, a 2-benzoimidazolyl group, a propylphenyl group, an isopropylphenyl group, a butylphenyl group, an isobutylphenyl group, a sec-butylphenylgroup, a tert-butylphenyl group.

24. (Previously presented) The electroluminescent device of claim 23, wherein one of the electrodes comprises a material which is one of transparent and translucent.

25. (Previously presented) The electroluminescent device of claim 24, wherein at least one of the electrodes comprises indium tin oxide (ITO).

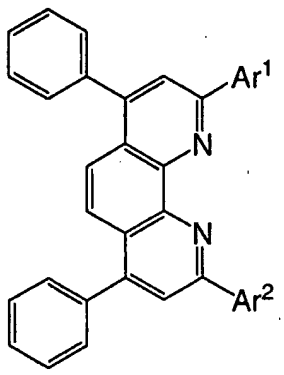
26-27. (Canceled)

28. (Previously presented) The electroluminescent device of claim 23, wherein the hole transporting layer is luminescent.

29. (Currently amended) An electroluminescent device comprising a first electrode, a second electrode, an electron transport layer, a hole transport layer, and a hole-blocking layer, wherein,

(a) the hole-blocking layer is distinct from the electron transport layer, and

(b) the hole-blocking layer comprises a compound of formula (V):



formula (V)

wherein Ar^1 and Ar^2 may be the same or different and independently represent an aryl group, and

Ar^1 and Ar^2 are selected from the group consisting of a 1-naphthyl group, a 9-anthryl group, a 2-fluorenyl group, a methylphenyl group, a dimethylphenyl group, a trimethylphenyl group, ~~a~~ an ethylphenyl group, a diethylphenyl group, a triethylphenyl group, a tert-butylphenyl group, a cyclohexylphenyl group, a phenylphenyl group.

30. (Previously presented) The electroluminescent device of claim 29, wherein at least one of the electrodes comprises a material which is one of transparent and translucent.

31. (Previously presented) The electroluminescent device of claim 30, wherein at least one of the electrodes comprises indium tin oxide (ITO).

32-33. (Canceled)

34. (Previously presented) The electroluminescent device of claim 30, wherein the hole transporting layer is luminescent.

35. (Previously presented) The electroluminescent device of claim 11 wherein:

the brightness of the device is at least 10,000 cd/m^2.

36. (Previously presented) A display device comprising the electroluminescent device of claim 35.

37. (Previously presented) The electroluminescent device of claim 17 wherein:

the brightness of the device is at least 10,000 cd/m^2.

38. (Previously presented) A display device comprising the electroluminescent device of claim 37.

39. (Previously presented) The electroluminescent device of claim 23 wherein:

the brightness of the device is at least 10,000 cd/m^2.

40. (Previously presented) A display device comprising the electroluminescent device of claim 39.

41. (Previously presented) The electroluminescent device of claim 29 wherein:

the brightness of the device is at least 10,000 cd/m^2.

42. (Previously presented) A display device comprising the electroluminescent device of claim 41.

The title is amended to reflect the claimed invention, and to avoid potential printing problems due to the use of different titles on different parts of the originally filed application papers.

The specification is amended to update the status of the parent application, and to correct various spelling errors.

Claim 17 is amended to overcome a rejection under 35 U.S.C. 112, 1st paragraph. The amendments to claim 17 are supported by various specific examples of compounds set forth in the original specification.

Claims 23 and 29 are amended to patentably distinguish the claimed device over that of Nakaya (EP 0 564 224). In Nakaya's device, the layer comprising the phenanthroline compound is an electron transport layer that inherently provides hole-blocking function. Nakaya does not suggest a hole-blocking layer separate from the electron transport layer.

The claims are also amended to correct spelling and grammatical errors.

Claims 11-13, 16-19, 22-25, 28-31 and 34-42 are allowed. Allowed claims 11-13, 16, 35, 36, 17-19, 22, 37, 38, 23-25, 28, 39, 40, 29-31, 34, 41 and 42 are renumbered as 1-24, respectively.

Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY
November 08, 2006

Marie R. Yamnitzky

MARIE YAMNITZKY
PRIMARY EXAMINER

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